$Li_{3,17}(P_{0.69}Ge_{0.24}Mo_{0.07})O_4\!\!:$ Growth under Electrical Field and the Structure

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The influence of electrical field on crystal growth from flux has been studied in the system Li₃PO₄-Li₄GeO₄-Li₂MoO₄-LiF. Growth occurs on the Pt-rod (anode) immersed into the flux due to temperature decrease with the simultaneous application of direct electrical current. The starting molar ratio between the starting components of the system (Li₃PO₄ : Li₄GeO₄ =1: 1) corresponded to the ratios which provided the stable crystallization of solid solution Li_{3+x}P_{1-x}Ge_xO₄ with x=0.31 at the absence of electrical field. When electrical current (V=0.08V) was applied to the growth system, the compound Li_{3.17}(P_{0.69}Ge_{0.24}Mo_{0.07})O₄ has been grown on Pt–rod. For the structure determination there was chosen the single crystal with size 0.13x0.17x0.20 mm.

Crystal structure of analyzed compound is similar to the structure of $L_{i_{3+x}}P_{1-x}Ge_xO_4$ (x=0.31). The partial substitution of $Ge^{4+}(P^{5+})$ for Mo^{6+} follows with the decrease of Li-atom content. In spite of it a significant amount of Li occupy 3 additional sites - 2 tetragonal (very close to 2 main Li-positions which are partially vacant) and 1 octahedral. The fourth additional Li-site found in $Li_{3+x}P_{1-x}Ge_xO_4$ (x=0.31) in our compound is empty.

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